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**National Standard of the People's
Republic Of China**

GB/T 229-2020

Replacing GB/T 229-2007

**Metallic materials - Charpy pendulum
impact test method**

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(ISO 148-1:2016, Metallic materials - Charpy pendulum impact test - Part 1:
Test method, MOD)

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 229-2007 "Metallic materials - Charpy pendulum impact test method". Compared with GB/T 229-2007, the main technical changes are as follows:

- In the scope, ADD the unnotched specimens; MAKE requirements for the terms and definitions, symbols and descriptions, dimensional deviations, specimen installation of unnotched specimens (see Chapter 1, 3.2.1, Table 1, Table 2, 8.1, Appendix A);
- MODIFY and ADD some terms and definitions (see 3.1.3, 3.2.1, 3.2.2; 3.2.1, 3.2.2 of the 2007 edition);
- ADD the symbol B of specimen thickness; ADD the symbol α of the angle when the pendulum is released; ADD the description of the elevation angle β_1 and β_2 ; ADD the symbol K_N of the nominal value of the initial potential energy; ADD the symbol M of the moment; ADD the energy loss symbol p caused by pointer friction, the energy loss symbol p' caused by bearing friction and air resistance, the correction symbol p_β for the energy loss caused by the elevation angle β ; MODIFY the symbol of shear section rate, which is changed to SFA; ADD the transition temperature symbol T_{t27} corresponding to the specified absorption energy value of 27J, the transition temperature symbol $T_{t50\%US}$ corresponding to 50% of the energy absorbed on the upper platform, the transition temperature symbol $T_{t50\%SFA}$ corresponding to the shear section rate of 50%, the transition temperature symbol $T_{t0.9}$ corresponding to lateral expansion value 0.9 mm (see Table 1; Table 1 of the 2007 edition);
- SUPPLEMENT and IMPROVE the principle of impact test (see Chapter 5; Chapter 5 of the 2007 edition);
- ADD the determination of friction loss (see 8.2);
- MODIFY the test temperature requirements (see 8.3.3; 8.2.3 of the 2007 edition);
- ADD the necessary and optional content of the test report [see 9.1 g), 9.2 j), k)];
- ADD the Informative Appendix E "Measuring uncertainty of absorbed energy value K " (see Appendix E);
- DELETE the Informative appendix of the high temperature or low

temperature compensation value (see Appendix E of the 2007 edition).

This standard uses the redrafting method to amend and adopt ISO 148-1:2016 "Metallic materials - Charpy pendulum impact test - Part 1: Test method".

Compared with ISO 148-1:2016, this standard has structural differences, adding clause 8.9 test results.

Compared with ISO 148-1:2016, this standard has technical differences. The terms involved in these differences have been marked by a vertical single line (|) on the outer margins.

The technical differences between this standard and ISO 148-1:2016 and the reasons are as follows:

- In the scope of Chapter 1, ADD the unnotched specimens to suit China's national conditions;
- Regarding normative references, this standard has adjusted the technical differences to adapt to Chinese technical conditions. The adjustments are reflected in Chapter 2 "Normative references". The specific adjustments are as follows:
 - USE GB/T 3808 which adopts the international standard through modification to replace ISO 148-2 (see 7.2, E.2.1.2);
 - ADD the reference to GB/T 2975 (see 6.4);
 - ADD the reference to GB/T 8170 (see 8.9);
 - ADD the reference to JJG 145 (see 7.2);
 - DELETE the ISO 268-1 (see Table 2 of ISO 148-1).
- In Table 1, ADD the symbols K_T and descriptions that were missed in the ISO standard; ADD the symbols and descriptions of the unnotched specimens correspondingly due to the addition of unnotched specimen in the Scope; CLARIFY the units of β_1 and β_2 as "°" and the unit of K_1 , K_2 , K_N as "J", to avoid unit confusion;
- MODIFY the last two paragraphs of the principle of Chapter 5 to be a note, because this part of the content is a further explanation of the principle;
- In 6.1.2, ADD the "specimens of other thicknesses can also be used through agreement", to expand the scope of application of this standard;
- In 6.4, ADD that "the cutting of specimen blanks shall be carried out in accordance with the relevant product standards or the provisions of GB/T2975" for the convenience of actual operation;
- In Table 2, ADD the size and tolerance of U-notch specimens which have a ligament width of 8 mm; ADD the notes for unnotched specimens; ADJUST the angle tolerance between adjacent longitudinal surfaces of the specimen; DELETE the tolerance grades of the two notches, to meet China's national conditions;

- For the convenience of application, ADD the symbols KW_2 and KW_8 used for the pendulum hammer blade of the unnotched specimen in 7.3;
- In order to facilitate the operation of the application of unnotched specimens, ADD the requirements for the installation position of unnotched specimens and the pre-test inspection requirements in 8.1;
- ADD the detailed requirements for bearing friction and windage loss in 8.2.2, to facilitate the implementation of the standard;
- In 8.5, ADD the lower limit of use of the testing machine and the requirements for resolution; ADD note 2 to explain it, to improve the operability of the standard and facilitate the implementation of the standard;
- In order to increase the operability, ADD the description in 8.6 when the pendulum does not break the specimen due to insufficient impact energy of the testing machine and the measured absorbed energy exceeds the energy range of the testing machine;
- In 8.9, ADD the energy-absorption rounding-off requirements to improve the standard operability;
- In 9.1, ADD the item c) notch type and ligament width (notch depth); in item d), ADD the requirement for expression method of specimen size, to improve the standard operability;
- In Appendix A, DELETE the sentence "the size of the centering clamp with thickness of 5 mm and 3 mm" due to data errors; ADD the requirements for clamps for unnotched specimens; ADD the requirements for clamps for U-notches, to improve the standard operability, to facilitate the implementation of standards.

This standard has made the following editorial changes:

- MODIFY the standard name;
- In the note of 3.1.2, ADD the expression that "use the letter W to represent unnotched specimens".

This standard was proposed by the China Iron and Steel Association.